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Editorial Comment

PROGRESS OF THE PENNSYLVANIA PLAN

UNDER the aggressive leadership of Doctor Ralph Matson of Portland, Oregon; President Elect of the American College of Chest Physicians; and Chairman of the Committee for the Advancement of Tuberculosis Organization in Medicine, rapid strides are being made in the formation of tuberculosis committees in all state and county medical societies affiliated with the American Medical Association.

It is hoped that the new committees as they are formed will be as potent in their respective localities as is necessary to bring case finding and case treatment up to the highest possible modern standard.

If fearless and interested physicians are selected for the committee memberships, much will be accomplished along the desired lines. A few high points of endeavor are the following:

1. Papers on tuberculosis, especially stressing case finding, early diagnosis, and modern treatment, should be presented in every season of medical society scientific meetings, state and county.

2. A study of state and county tuberculosis sanatoriums, so that the committee members are fully cognizant of their needs and problems. Outstanding needs of the sanatorium are outlined under "The Pennsylvania Plan."

3. Cooperation with other tuberculosis organizations, help them with the influence at your command, with constructive criticism. Quarreling and destructive criticism engender emotions that do not promote reform.

Try to educate your communities to be dissatisfied with "Dummy Directors", wherever they find them. Recognized evils that receive sufficient attention and publicity, tend to correct themselves. F.W.B.

PHYSICAL EXAMINATION

DURING recent years there has evolved a slogan in tuberculosis circles to this effect: "Tuberculosis should be seen and not heard." While in some measure this saying expresses a truth and emphasizes the extreme importance of studying every case by means of the x-ray and fluoroscope, the physical examination should not be neglected, nor only a niggardly value ascribed to it. The physical examination, particularly that of the chest, is an integral part of the whole examination. In many instances it is indispensable and at times affords the only means of the diagnostic approach. It is wisdom, therefore, for the physician to appreciate the value and the more complete perspective that the physical examination lends; and to per-

fect himself as much as possible in its execution.

To have had extensive experience and expert training in the larger clinics has not been the lot of most of us; to be endowed with that inherent ability some physicians possess is the heritage of only a few of us; but the observation of a few basic principles is to be had by all of us. It is to these the writer desires to call attention. They may be captioned under the headings: *quiet, comfort* and *concentration.*

It is absolutely essential that the examination of a chest be made in a quiet room. The noise of street traffic, the hum of an electric fan, the conversation of others in the room, the blowing of curtains, rattling of shades or the running of water—any of these may mean the difference between a satisfactory and unsatisfactory examination. Any doctor who specializes in or features chest work should have an inside examining room.

Comfort on both the part of the subject and the examiner is most conducive to a satisfactory examination and cramped, uncomfortable positions preclude it. For a brief quick orientation of the chest findings—such as in ward rounds in a sanatorium — the standing upright positions work very nicely. The patient slips off the bed, or out of his cure chair and stands in an erect, but relaxed manner beside it. The procedure of course is barred in very ill patients. In every chest examination, however, for the best results, a relaxed comfortable position for doctor and patient must be assured. In this connection, it may be emphasized that a sufficient exposure of the chest must be secured. No chest can be properly percussed or auscultated through the clothing. At times, in cases of timid, shy women, tact and patience is called for.

Lastly, but by no means of less importance, is the factor of concentration. A real chest examination cannot be made while the mind is wandering and dwelling upon matters far removed from the job at hand. Rales cannot be heard, nor differentiations in breath sounds made, while the examiner is thinking of his golf game. So—feel what you touch, hear what you listen to. In other words—

Concentrate! C.H.H.

"SURE CURES"

ALL chronic diseases are the meat and bread of "sure cures" and quackery. Without such ailments as rheumatism, "liver trouble", Brights Disease, "prostatic trouble", "backache", chronic constipation, cancer, et al, the quack and the patent medicine man would have long since ceased to exist. Pulmonary tuberculosis is about the only specific disease that has always attracted quackery. By specific, we mean that it is a disease caused by a definitely known organism—the tubercle bacillus.

Since the beginning of time, almost, every type of "sure cure" has been advocated for this chronic disease. Sufferers were once told to live in the barn and breath the air and odors from the cow-lot in order to recover from tuberculosis! Some of the fads and fancies that have been advocated since that time were certainly not improvements on that idea and probably much more harmful—no matter how bad the cow-lot might have been.

To detail the vast number of "miraculous cures" that have been used is impossible. It is sufficient to say that nearly every drug or chemical known to man and many combinations that were unknown have been recommended at one time or another to be taken by mouth or by inhalation or by injection or simply by "rubbing on" to kill the tubercle bacillus.

Nor are we immune today. Hardly a day passes that some tuberculosis specialist is not approached by some one who has definitely "discovered" a sure cure for tuberculosis. And, unfortunately, he frequently has affidavits from one or more doctors telling of his miraculous results! What's to be done about it?

Again the problem falls into the lap of the family physician. He must not only be equipped to make an early diagnosis of the disease, but he must be able to advise the patient relative to his treatment. He should warn the patient about quackery in this disease and not spare the details. Above all, the medical profession should make certain that every patient receives the advantages of modern treatment for tuberculosis, because a neglected patient is easy prey for the "miraculous healer".

It is unfortunate that no specific has yet

been discovered for this disease, but until it is, it is the doctor's duty to protect the unfortunate sufferer from the quacks.

R.B.H., Jr.

STOP, LOOK, AND LOOK! It is common knowledge that a negative sputum — absence of tubercle bacilli — does not rule out pulmonary tuberculosis. Indeed, it is to be hoped that the diagnosis will not have to be made only when they are present. It also is common knowledge, and rightly so, that the presence of tubercle bacilli in the sputum means pulmonary tuberculosis. However, and this is the "raison d'etre" for this editorial, there are circumstances under which tubercle bacilli are found in the sputum when the original, (dominant or perhaps best, primary) condition, is not tuberculosis. Because of this fact, the chest specialist has oftimes been placed in a rather embarassing position; and more important, the paramount pathological disturbance has been confused or not properly recognized. A latent tuberculous infection, such as commonly lies dormant within the lymph nodes in and about the hilus, may be stirred into activity with a release of its imprisioned bacilli, by another irritating and eroding disease process in the lungs. The most common offenders are suppurative disease and malignant growths. It is not very uncommon for a case of carcinoma of the lung to have tubercle bacilli in the sputum late in the evolution of the malignant process. Without the recognition of the facts above given, it would naturally be felt that the original diagnosis of carcinoma was an error; and the finder of the tubercle bacilli would throw out his chest in pride in refutation of the "specialist" who had made such a diagnosis. Perhaps, and not infrequently, the opportunity to employ curative surgery was missed and the mistake condoned.

Suppurative diseases of the lungs, usually present the problem in a different manner. They are usually recognized as such; but the resulting activation of an old tuberculous focus is not. This activation very often brings on to the stage a progressive tuberculosis which is confused with the original lesion, and consequently the proper treatment for this resulting tuberculous condition is not applied. It has been the writer's experience that the advent of the tuberculosis comes with the subsidence—operative or otherwise —of the suppurative process. Tubercle bacilli are now appearing in the sputum. Has it been an overlooked tuberculosis all the time, is the question that now forms in the mind of the attending physician. Again, has the examination of the sputum for tubercle bacilli been abandoned, and the exacerbation in the lungs accredited to the original process? A proper evaluation of the facts would mean whether or not the correct therapy is inaugurated; and whether or not the patient is saved from an unnecessary premature death from tuberculosis. Perhaps the moral of this editorial is

Stop, Look and Look! C.H.H.

POL N. CORYLLOS WITH the passing of Dr. Pol N. Coryllos of New York City, one of the most capable and versatile thoracic surgeons has departed from our midst. He will be missed at the medical meetings, where his presence, interesting papers and discussions were always in demand.

Dr. Coryllos was a Fellow of the American College of Chest Physicians as well as a member of numerous other medical societies. He was a prolific writer and his writings will live long after Pol Coryllos, the man, is forgotten. We join, with his many friends, in a salute to Pol Coryllos; surgeon, author, and good fellow. C.M.H.

ERRATUM:

Through an error, the initials of Dr. Orville E. Egbert, who contributed the editorial for the September issue of the journal, entitled, "Allergy in Tuberculosis" was omitted. It is the custom of the Editorial Board of *Diseases of the Chest* to initial all editorials so that our readers may refer to the authors when desired.

The Evolution of the Treatment of Pulmonary Tuberculosis*

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TREATMENT of pulmonary tuberculosis has run the gamut of methods from the most distant times. The ancients, with their faulty theories of disease and their wholly empirical materia medica, advised the most extraordinary and often the most disgusting combinations for curing phthisis. In pre-Hippocratic days, medicine was intimately associated with religion and the Father of Medicine himself only partly succeeded in disentangling the two. In the Middle Ages Patron Saints for special diseases prevailed, just as special Deities had in Egyptian times. Pliny the Elder, who perished at Pompeii in the eruption of Vesuvius, A. D. 79, gives the following as his "cure" for pulmonary tuberculosis:

> "The cure for phthisis is effected by taking a wolf's liver boiled in thin wine; the bacon of a sow which has been fed upon herbs; or the flesh of a she-ass, eaten with the broth; the last mode in particular being the one that is employed by the people of Achaia. Smoke of dried cow-dung inhaled through a reed is remarkably good for phthisis."

Unquestionably scrofula was very prevalent in ancient times, if one can judge from the numerous prescriptions for its cure. Among the remedies mentioned may be cited eating "the middle of a snake"; "to dig up a cricket with the earth of its hole and make a liniment"; or "a mole's right foot was also a good remedy." To our modern minds, these rather pathetic prescriptions appear as the "whole time high" of empiricism and one wonders at their origin.

The Chinese also had extraordinary prescriptions for consumption. For example: "The testicles of the dog, the lungs of the hog, and the flesh of the crow were recommended and furthermore, 'to know if the remedy is good, one chews a little, runs for an hour; and if one does not then vomit, the remedy is good.' "

Hippocrates and Galen used phlebotomy for hemoptysis (perhaps not a bad idea and more or less analogous to the use of large doses of atropine (gr. 1/33 to 1/25 hypodermically) and also for beginning phthisis; though probably their ideas of a truly minimal case would differ vastly from ours). Thomas Dover, the originator of Dover's powder, which all of us use occasionally, advised, in cases of consumption, taking "six ounces of blood every day for a fortnight if he lived so long and then every other day, then every third day, then every fifth day for the same time." Were this practiced in 1937, what a bonanza for the professional donors and the transfusion specialists!

Louis, whose "Recherches sur la Phthisie" constitutes one of the classics of all time, strongly recommends the use of opium, probably confounding the subsidence of cough by the use of this drug with definite improvement in the diseased area. Needless to say, opium in some form is still abundantly used in the treatment of tuberculosis, but only as a palliative.

With our modern ideas of rest as the cornerstone upon which must be based the treatment of all tuberculosis, whether medical or surgical, it is interesting to note how often this element was mentioned by ancient, mediaeval and modern writers before receiving its accolade at the hands of contemporaneous authors.

"Galen, who was sceptical regarding the cure of consumption, gathered from a suggestion of Hippocrates in regard to horizontal rest for leg ulcers, that ulceration of the lungs demanded rest in order to heal. Galen realized that the lungs were always in motion, and also that the cough aggravated the disease . . Celsus counseled patients with hemoptyses to take to their beds and remain in absolute silence."

Perhaps Morgagni (1761) should be credited with the first attempted application of the

* Read by invitation before the Fifth District Medical Society of Georgia, at its meeting in Atlanta on October 7, 1937.

principle of rest. He ordered a patient with pulmonary and laryngeal tuberculosis "to stay in a room at even temperature, to be free from all care, to listen to his friends rather than to talk to them, and if speech was necessary to confine it to 'a most gentle whisper.' The patient recovered." This is very much in line with our present advice, save where we feel that the laryngeal lesion is suitable for treatment with the electro-cautery.

Jean Pierre David (1779), a surgeon, gave the first concrete illustration of the value of rest in the treatment of tuberculosis in his essay: "Les Effets du Mouvement et du Repos dans les Maladies Chirurgicales." In his preliminary discussion he says: "When Nature, to save an individual, sacrifices movement of a part or of its shape, art should frequently consist in not disputing but in being a spectator"; and again, "The history of our errors is often more instructive to others than the story of our successes."

Armond Trouseau, in 1737, wrote a masterly article on laryngeal tuberculosis in which he advocated silence and "writing on a slate." His sage counsel was unobserved for many years and the idea was not again suggested until the twentieth century, when Sir St. Clair Thompson, a British laryngologist who was himself a sufferer from tuberculous laryngitis, emphasized the desirability of "writing on a scratch pad."

John Hilton (1804-1876), whose classic, "Rest and Pain" either has been read or will be read by every person in this audience, was, in 1857, probably the first to record the benefit of bed-rest in pulmonary tuberculosis. A patient came to him suffering from a tuberculous hip, which he promptly splinted. Against his better judgment and because of the importunings of the family, he removed the hip splint after six months, only to have the disease become reactivated. Having recognized that in addition the patient had bilateral apical pulmonary disease, he was astounded to find at the end of a half year's bed-rest to what an extent the pulmonary pathology had receded. He was also among the first to show that bed-rest was beneficial, rather than harmful, to the general health and to-day we still have to argue this question with patients and particularly with their families! It is obvious from the foregoing that rest in tuberculosis was instigated primarily by surgeons dealing essentially with what we now consider cases of "surgical tuberculosis."

We now leave what we may call "ancient rest" and proceed to other considerations in the evolution of the treatment of tuberculosis before returning to "modern rest."

Down through the ages, in the treatment of tuberculosis, climate has been a "leit motif." Susenta in the "Yejurveda" (Science of the Length of Life) advises that "the consumptive should go and live in elevated regions." Galen sent his patients to Tabia, near Vesuvius, a mountain resort frequented by tuberculous patients for hundreds of years. It was early believed that emesis was good for the tuberculous, probably because sputum was more copiously evacuated when nausea was present and, therefore, sea voyages were advised. As many could not comply with the advice given because of financial restrictions, various infamous methods were suggested for producing nausea far from the broad ocean. Swinging was one of them which had an ephemeral vogue, but Erasmus Darwin, the grandfather of Charles Darwin, suggested that "instead of swinging, nausea could be conveniently provided by rotatory motion in a chair, suspended by a rope, and turned thirty times around several times a day for an hour or two!"

Up to approximately thirty years ago, climate was looked upon as being a sovereign element in the treatment of tuberculosis. Saranac Lake, Asheville, Colorado, the Southwest and California, to say nothing of Switzerland, the Black Forest and Egypt, were supposed to possess some sacrosanct qualities which exercised a special influence upon the ravages of the tubercle bacillus. During the past fifteen years the pendulum has swung to the other extreme, and by many, climate is now decried as having absolutely no influence upon the course of the disease. Both extremes are wrong. The unlimited faith in climate that ushered in the twentieth century is a dream from which the dreamers have awakened. The condemnation of climate as an element which has no influence in the treatment of tuberculosis is a fetish to which too many cling at the present moment. The aphorism, "What you do is far more important than where you do it" is absolutely true.

I would much prefer to have a patient live *right* in Boston or New Orleans than live *wrong* in Asheville or Saranac or Tucson; but, all other things being equal, proper life in a particularly salubrious climate is an advantage and none can know it better than those of us who happen to live and practice in such a locality. Of course, we cannot yell this from the housetops, for we would lay ourselves open to the accusation that we were crying for our bread and butter. None the less, it is the truth and, were it practicable, numberless witnesses for the defense could be called upon to testify.

A change has also come over the evaluation of the importance of fresh air in treatment. A hundred years ago the tuberculous patient was deprived of all possible air and light and was almost suffocated. From the latter part of the nineteenth century the pendulum swung to the other extreme, so that when I took the cure in 1905 and for many years thereafter, the patient was made to feel that every hour he was out of doors he was getting better and every hour he was indoors he was getting worse. Weak, debilitated individuals were forced to remain on porches in sub-zero weather, so weighted down with clothing and blankets as to be well-nigh crushed. The sleeping-porch was considered an absolute essential. Now we know that all that is needed is fresh, freely circulating air; that artificial heat is not taboo and that comfort is infinitely preferable to hardship. Some of our long passed colleagues saw the light. George Bodington (1799-1882) wrote: "To live in and breathe freely, the open air . . . is one important and essential remedy in arresting the progress of tuberculosis"; and a far-seeing physician, W. Black, had written in 1781: "Seeing that such multitudes die of consumption in London, and knowing that pure air is at least equal to diet or medicines in this direful distemper, would not two or three hospitals built for consumptive patients, at a few miles distant from London, save hundreds of lives annually?" Oddly enough, such outstanding figures as Bayle, Laennec and Louis paid no attention to fresh air. This is all the more astounding in view of the fact that Laennec was a sufferer from the disease, and finally died of it.

All workers in tuberculosis are agreed that sanatorium treatment of the disease is the best, both from the standpoint of chances for recovery for the patient and from that of lessening contacts and consequent spreading of infection. I have enlarged upon this in a paper written in 1931, entitled: "Home Treatment versus Sanatorium Treatment in Pulmonary Tuberculosis," but time will not permit dwelling upon that particular topic at present. It seems strange that with hospitals flourishing for so many centuries the tuberculosis hospital or sanatorium is so comparatively new. Brehmer established the first sanatorium at Gorbersdorf in 1859, and his pupil Dettweiler, the second, at Falkenstein in 1870. To be sure, the Brompton Hospital for Consumptives had been started in England in 1848, "but open air treatment was not in vogue, and about all patients seemed to do was to avoid draughts and take cod liver oil." Trudeau, in 1884, founded the Adirondack Cottage Sanatorium at Saranac Lake — the first in this country — in which the importance of fresh air and of rest were emphasized. Based upon it as a model in principle, there are to-day in the United States about 600 sanatoria with a capacity of over 80,000 beds. Verily, when the sanatorium in this nation did begin to increase and multiply, it did so with giant strides!

One of the most remarkable chapters in the evolution of the treatment of tuberculosis is the rise, brilliant reign and complete collapse of tuberculin as a therapeutic agent. When Koch, in 1892, announced the discovery of old tuberculin, it was felt that a cure for tuberculosis had been achieved. At first large doses were employed and severe reactions desired (and secured!). There is no doubt that many people were killed by over-dosage. Soon objection to this method of administration arose and it was thought that good results were obtained by giving truly homeopathic doses — a millionth of a milligram, and slowly increasing. The medical world went tuberculin-wild! The remedy was at the height of its popularity from about 1908 to 1913. Any number of tuberculins were on the market, manufactured in all manner of ways. At one time the list numbered over seventy, but the most popular were Old Tuberculin, Bacillus Emulsion (which was really a vaccine of tubercle bacilli), Deny's Tuberculin, and, es-

pecially in this country, von Ruck's Watery Extract. Everybody gave tuberculin to almost every patient. The pharmaceutical houses sensed the need for participation, and accordingly serial dilutions were prepared and sold to physicians, many of whom knew nothing of the working of tuberculin, its mode of action, or the indications for its use; but who had simply jumped on the band wagon and were blissfully giving their patients 3 drops of Solution 4, or 8 drops of Solution 7, as the case might be. The literature on tuberculin was enormous and contributed to by the best minds in the country. After 1913 its popularity waned rapidly. The reason? It is difficult to say. Perhaps because faulty use made people afraid of it; perhaps because with the lapse of years results were not as good as it had been fancied they would be; perhaps because of the advent of stricter bed-rest with its excellent results; and perhaps, too, because of the dawning adolescence of that greatest of all boons to the tuberculous, collapse therapy. In any event, tuberculin is "gone with the wind" in pulmonary cases, though still used very charily in surgical tuberculosis.

For the past sixty years or so there always has seemed to be a "treatment" for tuberculosis. Beginning with the advice given in the 70s and 80s, "go West, young man, and rough it," down through the era when climate was everything, through the tuberculin period, we have finally come to the phase which may be called "modern rest." The period of modern rest may be said to begin at the close of the tuberculin craze, or about 1914. It started with physical rest, bed-rest; in the most pronounced examples the patient not being allowed to move; use of the bed-pan insisted upon; self-feeding prohibited. Not many physicians were such extremists, for the effect upon the patient's morale was very bad and he inevitably felt that he was, indeed, sick unto death. In the majority of instances months and months of bed-rest were prescribed, the patient being allowed to use a commode and to feed himself. Bed baths were prescribed and all physical effort was forbidden. This intensive bed-rest did wonders for many, but artificial pneumothorax was becoming more and more known and thus there occurred a transition from physical rest alone to physical rest plus physiological rest, which could be obtained if the lung could be placed in an air splint and therefore immobilized. It was further found that the addition of physiological rest was a great short-cut and reduced the time and tedium of bed-rest. Pneumothorax became more and more common. Given at first in practically unilateral cases because of the fear of added respiratory strain upon the so-called "good lung," it soon became evident that compression of one lung and elimination of poison absorption would have a salutary effect upon the contralateral lung; and the scope of pneumothorax treatment was correspondingly widened.

James Carson, of Liverpool, in 1821, first suggested the employment of artificial pneumothorax. He stated that by this procedure "the diseased part would be placed in a quiescent state, receiving little or no disturbance from the movements of respiration, which would be performed solely by the other lung, and the divided surfaces would be brought into close contact by the same resilient power which before had kept them asunder."

Carson's advice went unheeded and it remained for Forlanini, of the University of Pavia, in 1882, to propose anew artificial pneumothorax, the idea having come to him from observing the beneficial influence upon largely unilateral pulmonary tuberculosis of the development of a pleural effusion, or of a spontaneous pneumothorax did the patient survive the initial shock. He succeeded in persuading the medical profession in 1892 that his claims were valid and thenceforth the procedure was put into practice in Europe. I believe that Dr. Mary Lapham, of Highlands, North Carolina, was one of the first physicians in this country to use the new method, for I heard her read a paper on the subject at Greensboro in 1908 and I know that I listened to it through the ears of a "doubting Thomas," little realizing that three years later I would be giving my first injections. Dr. John B. Murphy, of Chicago, with no knowledge of preceding work, attempted artificial pneumothorax in 1898; but believed in compressing the entire lung at one sitting and secured such severe reactions that, feeling the remedy to be worse than the disease, he abandoned the procedure.

Even before collapse therapy by means of pneumothorax had been seen to be of value, certain surgeons, desiring to secure rest for the damaged lung, had sought rib resection, with its resulting pulmonary collapse, as a solution. The credit for the first partial thoracoplasty (three ribs resected, the second, third and fourth) must go to de Cérenville, of Lausanne, who performed the operation as early as 1885; but the first complete thoracoplasty (exclusive of the first rib) was not done until 1907, when it was performed by Friedrich. Ferdinand Sauerbruch, of Munich, did his first complete thoracoplasty (first rib included) in 1909. Physicians in Europe, and far more so in this country, were slow to fancy the new approach to the cure of tuberculosis through surgery; and it is true that the early procedures were very radical, tremendously shocking and exceedingly painful.

Partial pneumothoraces with unclosed cavities could be dealt with only by abandoning the pneumothorax and resorting to thoracoplasty with all its horrors, until in 1913 Jacobaeus, of Sweden, devised the procedure of internal pneumolysis whereby, in suitable cases, an incomplete pneumothorax might be rendered complete by cauterizing, and thereby severing, the offending adhesions. This operation has been very popular and exceedingly successful. Ralph Matson, of Portland, Oregon, deserves mention here as being the pioneer in this country to popularize and improve this operation. In the past three years I have had twenty-eight patients operated on by Dr. Julian Moore, of Asheville, with most gratifying results in the vast majority of cases.

Phrenicectomy was first done by Sauerbruch in 1911. Stuertz had previously proposed it, but Sauerbruch did it knowing nothing of Stuertz's publication. The operation now done most frequently is phrenic crushing, together with cutting the accessory branches, which paralyzes the corresponding dome of the diaphragm for eight or nine months. If it is desired to make the temporary paralysis permanent, it is a very simple matter to do so. The phrenic operation is rarely of great value per se; but as an adjunct to pneumothorax or as a preliminary to thoracoplasty, and occasionally as a palliative to relieve distressing symptoms, it occupies a definite place in the surgery of tuberculosis.

To-day the tendency of treatment is all toward collapse in some form and by some means. Collapse therapy is the greatest advance made in the treatment of tuberculosis since the introduction of physical rest, and is the only method offering a good chance of recovery to the far advanced case. Thoracic surgery is making great strides and the men most prominent in this branch of the surgical art are individuals that know a great deal about the medical aspect of tuberculosis, which is well; for in thoracic surgery intimate team-work is necessary between physician and surgeon, and the more the one knows about the other's domain the better. With enthusiasm for collapse running high, I feel that perhaps the pendulum has swung too far to the right. There are men advocating collapse, in every minimal case, as soon as the diagnosis is made. With this view I cannot sympathize. There are certain dangers in any form of collapse therapy. There are many early cases of tuberculosis that will heal under bed-rest. I believe that if the lesion is slight and not destructive, do not collapse; if the lesion is slight but *progressive*, collapse.

In many large cities doctors are conducting ambulant pneumothorax clinics, collapsing the lung and hospitalizing the patient for a few days, then letting him go home and return to his work if possible. This is not, by any means, an ideal scheme; but, I realize full well, is a necessity in thickly populated districts where hospital beds are lacking and where the economic status of the patient is such as to render return to work at the earliest possible moment imperative. Another makeshift that is being employed both in this state (I believe) and, I know, in North Carolina, to which I cannot give my unqualified approval, is that of having rural physicians go to the State Sanatorium, witness and give pneumothorax refills, purchase the necessary apparatus, and then, when their pneumothorax patients leave the sanatorium and return home, continue the refills. This procedure, again, is due to insufficient sanatorium beds and to the necessity of a more rapid turnover in the state institution; but it is rather deplorable because there is far more

to the administration of pneumothorax than the simple technique of inserting a needle between the ribs into the pleural cavity and then injecting air. Considerable judgment is required in conducting a pneumothorax case, judgment which obviously the individual who has but two or three cases to treat cannot be expected to fully exercise. Nevertheless, these procedures probably result in the greatest good to the greatest number and something must be done to eliminate the enormous waiting lists of various state sanatoria, for, because of the length of time that must elapse from application to admission, the chance of recovery that the patient may have had is often greatly lessened.

I feel that there is danger in the evolution of the treatment of tuberculosis toward making it a surgical disease. I have not the least objection to its being classed as a surgical disease if that is where it belongs; but I cannot think of any disease that, taken by and large, strikes me as more *medical* than does pulmonary tuberculosis. It is essentially a medical disease that, in many properly selected cases, can be enormously aided, and often cured, by surgery; but fundamentally it belongs to the realm of medicine and it always will.

It would seem, then, that the treatment of tuberculosis has changed vastly with the march of time, and that the element of rest has come to be the cornerstone upon which the edifice of modern therapy is erected: rest, both physical for the entire individual and physiological for the diseased organ. Will something else supersede rest? I do not think that anything will ever supersede it, though we may find new adjuvants. As has been brought forth, attempts to fight tuberculosis with biological products (the tuberculins) were not successful. In the past few years attempts have been made to combat the disease along chemical lines, the product receiving the most attention being Gold-Sodium-Thyosulphate, sold under the tradename of Sanocrysin. Up to the present the results obtained abroad have not been sufficiently conclusive to warrant placing any great faith in the remedy. It has been used but scantily in this country.

B. C. G. (Bacillus Calmette-Guerin), a vaccine of living but attenuated bovine tubercle bacilli, for vaccinating infants against tuberculosis, has been in existence too short a time to enable conclusions to be drawn as to its value. We must wait until the vaccinated infants grow up and then compare the morbidity of tuberculosis in those vaccinated with that in the non-vaccinated.

Collapse therapy in its various forms has proved a great short-cut, as well as a life-saver, in the treatment of tuberculosis; but the fact remains that a considerable length of time is necessary for recovery from the disease and the patient who gets well under a couple of years is lucky beyond the average.

We do not know what the future will bring forth — perhaps an immunizing hypodermic, perhaps a curative serum or vaccine or metal; who knows? Our treatment now represents the latest, but by no means the ultimate link in the therapeutic chain begun centuries ago. When we think back upon what has been done in the treatment of tuberculosis in the past seventy-five years and when we see the advances that have been made, we should look confidently to the future and feel that somewhere, somehow, sometime (and that not too far away) wll be found the ideal treatment; and that with its discovery will come the triumphant culmination of all the efforts that have been made throughout the ages to control the ravages of the tubercle bacillus. *213 Arcade Building.*

N. B. In the preparation of this paper I have been greatly aided by data obtained from *Tuberculosis*, by Dr. Gerald B. Webb, appearing as one of the Series of "Clio Medica," published by Paul B. Hoeber of New York; and also by *The Surgery of Pulmonary Tuberculosis*, by Dr. John Alexander, published by Lea & Febiger, of Philadelphia.

"The most important factor in diagnosis in the majority of cases of pulmonary tuberculosis is keeping the disease in mind."

Lawrason Brown, M. D.

Pneumoperitoneum, Oxyperitoneum, and Nitroperitoneum in the Treatment of Pulmonary and Abdominal Tuberculosis*

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PNEUMOPERITONEUM is the injection of air or other gas into the peritoneal cavity, or the presence of gas in the peritoneal cavity; oxyperitoneum is pneumoperitoneum in which oxygen is the inflating gas; nitroperitoneum is pneumoperitoneum in which nitrogen is the inflating gas; when speaking of pneumoperitoneum artificially produced, we mean air unless otherwise specified.

Historical

Bainbridge[1], in January, 1908, spoke before the Medical Society of the State of New York on Oxygen in Surgery. He mentioned that Doctor Gothmay tried, but was unable to kill an animal by over-distension. In 1909[3], he reported seventeen cases of tuberculous enteritis with ulceration, and tuberculous peritonitis, cured by oxyperitoneum treatment.

Dr. John A. McGlinn of Philadelphia[2], in June, 1908, reported before the Philadelphia Obstetrical Society, the successful treatment of tuberculous peritonitis by inflating the peritoneal cavity with oxygen.

Meeker[4], in 1912 inflated the abdomen with oxygen after laparotomy in a case of tuberculous peritonitis with ascites, which showed immediate improvement and rapid cure.

Goodwin[5], in 1912, reported encouraging results with the same procedure after four years' experience.

Rost[6], in 1920, treated by inflation with oxygen, four cases of psoas abscess, three cases of tuberculosis of the knee, and one of tuberculous peritonitis. In describing the peritonitis case, which was exudative, he said, "It was an advanced case with a certain amount of matting of the intestine and large masses of tuberculous material in the mesentary. The patient was very emaciated, was running a hectic temperature, and suffered a great deal of pain and discomfort. He was operated on by me before I had hit upon the oxygen method, and his abdominal cavity had been well irrigated with saline fourteen days previous to using the inflation method." In this case the abdomen was inflated with oxygen until tympanitic as a drum. Two hours later discomfort ceased, and the temperature dropped to normal that night and remained so. The man received two subsequent inflations, became well, and remained well.

Weil and Loileseur[7], in 1921, reported their experience with air injections into the peritoneal cavity of six cases of tuberculous peritonitis with ascites, after removal of the fluid. In spite of the fact that they gave only from one to five treatments, they reported fifty per cent of cures.

Fritz[8], in 1921, using air; Stein[9], in 1922, using oxygen; Mattick[10], in 1924, using oxygen; Gilbert[11], in 1924, using air; and E. W. Hayes[12], in 1924, using oxygen, reported excellent results in tuberculous peritonitis, with and without exudate, and in tuberculous enteritis.

Banyai[13], in 1931, reported using pneumoperitoneum in treatment of tuberculous enterocolitis, and in 1934[14], first reported pneumoperitoneum in treatment of pulmonary tuberculosis, with a subsequent report in 1937[15].

Trimble and Waldrip[16], reported a series of cases of pneumoperitoneum treated for the pulmonary effect of raising the diaphragm.

Dr. A. Worth Hobby[17], of Atlanta, Georgia, has used pneumoperitoneum in treatment of nineteen cases of pulmonary tuberculosis. He states regarding pneumoperitoneum: "...its usefulness in selected cases has been proved in the short time it has been utilized."

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* Read at the Philadelphia County Medical Society, April 20, 1938.

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Choice of Gas

Oxygen is used by me for the initial induction of pneumoperitoneum and for the first few refills, in every case. The reason is the rapid absorption of oxygen by the tissues should any gas fail to be placed or retained in the peritoneal cavity. Oxygen seems to be more therapeutically effective in treatment of tuberculous enterocolitis and tuberculous peritonitis. The chief objection to its continued use over a long period of time is the rapidity with which it is absorbed from the peritoneal cavity; refills must be given twice weekly.

Nitrogen is used in refills as soon as there is freedom from adhesions and a free space in the peritoneal cavity in which to insert the needle. It is used in those cases which do not need the local effect of the oxygen in the peritoneal cavity, but where the sole need is elevation of the diaphragm. Nitrogen refills need be given only at two week intervals.

Air can be used in place of oxygen. It does not seem as active therapeutically, but remains longer in the peritoneal cavity, so that refills need be given only weekly.

Technic

Patient lies on back, abdomen and lower chest exposed. Skin in operative area is sterilized with Untinted Tincture of Metaphen or Untinted Tincture Mercressin. A point just below the rib margin in the left nipple line is selected.

With strictly aseptic technic, the skin and subcutaneous tissue is anesthetized with an injection of 2 c.c. of ½ per cent sterile Novocain solution, using a 27 gauge needle. Then a 2¼ inch, 19 gauge rustless steel needle attached to a 5 c.c. syringe of ½ per cent sterile Novocain solution and to the gas line from the pneumothorax apparatus by means of a three-way stopcock, is inserted into the anesthetized spot, slowly advancing the needle, and endeavoring to anesthetize ahead of the point by frequent small injections of novocain from the attached syringe. This proceeds down to and through the peritoneum, which can be identified when encountered by the needle point by the experienced pneumothorax operator. The valve of the stopcock is then turned, disconnecting the syringe and connecting the needle with the gas line from the pneumothorax apparatus, and oxygen is allowed to flow.

The amount of gas injected depends upon the pressure caused by the introduction of the gas, which is measured on the manometer tube of the apparatus, and also upon the feeling of fullness of the patient. Pressure should not go above plus four centimeters of water at the first injection, with increase of one centimeter of water at succeeding refills up to 10 or 12.

The procedure should be entirely painless, but there should be slight discomfort between the shoulders immediately after the initial and first few refills, due to raising of the diaphragm. No dressing should be applied after withdrawal of the needle.

Physical Results of Pneumoperitoneum

1. Diaphragmatic elevation, bilateral.
2. Separation of liver, stomach, and spleen, from the diaphragm.
3. Separation of all but very strong adhesions in the abdomen.
4. Diminution in size of the thoracic cage, favoring selective collapse of diseased lung tissue.

Indications for Pneumoperitoneum

1. Tuberculous peritonitis with or without fluid.
2. Tuberculous enterocolitis.
3. Tuberculosis of the mesentary.
4. Persistent vomiting in tuberculous patient (adhesions or after left phrenic operation).
5. Tuberculosis of the lungs in any case where pneumothorax is indicated, but impossible or ineffective on account of irremovable pleural adhesions.
6. Advanced cases of bilateral pulmonary tuberculosis in which all functioning lung is needed. Unlike pneumothorax, I have never seen pneumoperitoneum increase dyspnea.

Advantages of Pneumoperitoneum Over Phrenic Crush or Exeresis

While pneumoperitoneum raises the diaphragm, it frees it from the dead weight of the liver, thus increasing the expulsive motility of the diaphragm under cough. Patients with great regularity note the increased ease

and diminished effort with which they can raise sputum and clear their bronchial passages. There is also the advantage of rise of both sides of the diaphragm.

Gastric symptoms are alleviated by pneumoperitoneum, whereas after left sided phrenic interruption, the gastric difficulties are often severe and persistent, to such an extent as to interfere with nourishment of the patient, so necessary in tuberculosis.

Pneumoperitoneum can be abandoned at will; phrenic interruption persists for at least six months.

While the immediate results of phrenic interruption are sometimes brilliant, too often the lower lobe becomes a cesspool of stagnant secretions, which cannot be removed due to the phrenic palsy interfering with cough; following, we have pulmonary interstitial fibrosis and bronchiectasis. And, if the patient hemorrhages after a phrenic operation, there is danger of drowning in the blood, or at least a septic pneumonia. The late results of phrenic interruption are so discouraging that there has been very general abandonment of the procedure except in special cases.

Illustrative Cases

C. J. S., white, male, 28 years. In 1929 he developed pulmonary tuberculosis with a small cavity in left upper lobe. He was kept in bed at home three months. The cavity was said to have closed at that time and he made an apparently good recovery. I did not see him during that illness. Whereas, he had been previously constipated, from the time of that attack he invariably had liquid stools, two to three a day.

He was first seen by me December 27, 1935, six years later, referred by Dr. George Lorenz, because of repeated pulmonary hemorrhages from the left upper lobe, in which there was definite signs of activity with two cavities, confirmed by x-ray and positive sputum. The left lung was promptly collapsed by artificial pneumothorax with loss of sputum, gain in weight and apparent health, with the exception of the liquid stools, which continued unchanged.

In March, 1937, fifteen months after the start of his pneumothorax and while it was still being continued, he began to get insidiously increasing discomfort in the region of his ascending colon, with low grade fever and loss of weight. He was hospitalized and continued to become worse until June 10th, when Oxyperitoneum was started. The fever gradually subsided, pain ceased, weight increased. He was discharged from the hospital June 22nd, only twelve days after his initial oxyperitoneum. His refills were changed to nitrogen, which he has been receiving at two week intervals since. The stools gradually lost their liquid character until now they are similar to their condition prior to his first active attack in 1929.

In this case, we accomplished in twelve days vastly more than was achieved by three months absolute bed rest with high caloric, high vitamin diet.

* * * * *

L. M. B., white, female, was 32 years old when diagnosed as pulmonary tuberculosis. Usual symptoms, including several hemorrages, dated back one year prior to diagnosis. The first positive sputum of which I have record, was in February, 1936. I first saw her in March, 1936, although she had been in Hamburg, Pennsylvania, State Sanatorium in 1931, and Mount Alto State Sanatorium in 1936. In July, 1936, pneumothorax of right lung was instituted because of repeated large hemorrhages. Abdominal distress and frequent vomiting were present throughout the time of her observation, and in spite of the pneumothorax became so much worse that by March, 1938, she was confined to her bed, the pain became very severe, and the vomiting occurred with every ingestion of food or liquid.

Oxyperitoneum was induced March 24, 1938, and the vomiting ceased in the first two days. The abdominal symptoms are relieved, and she is now gaining weight. She has not hemorrhaged since, though she did frequently before, in spite of her pneumothorax.

* * * * *

M. R., white, female, age 36. History of chronic fibroid tuberculosis of twenty years' duration. Chronic laryngeal tuberculosis with recurring acute exacerbation and constant hoarseness. She was first seen by me March 14, 1937. At that time, she had extensive infection of the left lung with persistent rales throughout, moderate to slight involvement of right lung. Pneumothorax was tried, but

air could be induced, even under positive pressure, into the base only, where it was completely ineffectual. Sanatorium care, followed by months of absolute rest in a mountain hotel, failed to diminish the activity in the left lung. Oxyperitoneum was instituted on September 27, 1937, with great difficulty due to the great amount of peritoneal adhesions. It is still being continued. The signs of activity have disappeared, x-ray reveals improvement in both lungs, and the patient is gaining in a feeling of well being, weight, and strength.

* * * * *

J. F. (Fig. No. 1), white, male, 26 years, was first seen and given oxyperitoneum by me January 11, 1938, after three months in Philadelphia General Hospital and fifteen months in Hamburg State Sanatorium. A large cavity in the right upper lobe, while he was in the Philadelphia General Hospital, continued to increase in size in spite of rest treatment. Thoracoplasty was advised. Pneumothorax was attempted in Philadelphia General Hospital and Hamburg, but could not be done because of pleural adhesions (Fig. No. 2). Three months' treatment by pneumoperitoneum have diminished the size of his cavity, the amount of his sputum, and the number of tuberculosis bacilli in the sputum (Fig. No. 3).

* * * * *

R. B., white, female, 31 years, had chronic pulmonary tuberculosis and tuberculous peritonitis, duration 1½ years. She was admitted to my service in St. Luke's and Children's Hospital, December 28, 1937, with history of discharge from State Sanatorium after four months' treatment, the last three of which were spent in bed. Vomiting was constant during those months. Oxyperitoneum was induced the day of admission. Vomiting immediately stopped. Patient has regained lost weight and wants to go to work. She is symptom free. Her stay in the hospital was four days. Her pneumoperitoneum is being maintained by weekly injections of air.

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N. S., white, female, age 36 years, had minimal pulmonary tuberculosis, inactive. Ten years of abdominal pain, secondary anemia, low grade fever, loss of weight. Blood recovered, weight regained and abdominal symptoms ceased promptly with oxyperitoneum treatment. Patient had been diagnosed as neurasthenic after thorough study in two of our foremost hospitals.

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A. M., white, male, 52 years, had bilateral, advanced pulmonary tuberculosis, chronic and active. Pneumoperitoneum was begun November 16, 1937. Dyspnea is diminished, general health is improved, and he has returned to his work, which is sedentary. X-ray shows considerable clearing of his lung fields.

* * * * *

I. H., white, female, 34 years, had tubular bronchiectasis of the left lower bronchial tree. This case is not of proven tuberculous origin. Pneumoperitoneum is being tried along with lipiodol therapy to see if freeing of the diaphragm will assist in clearing the bronchi of the retained secretions. Treatment was started three weeks ago; too recent to form any opinion.

Conclusions

Pneumoperitoneum is a safe procedure in the hands of the trained pneumothorax operator. It is painless, and leaves no scar.

It is far superior in every way to phrenic exeresis or crush.

It should be employed in all cases of tuberculosis of the mesentary, peritoneum, and intestine.

Pneumoperitoneum should be used, in addition to pneumothorax, in those tuberculous cases having vomiting attacks, extreme repugnance to food, or unexplained chronic abdominal pain.

Pneumoperitoneum should be employed in all cases where pneumothorax is indicated, but impossible or ineffectual, due to adhesions, before more dangerous procedures, such as thoracoplasty, are resorted to.

Pneumoperitoneum should be used in those cases of pulmonary tuberculosis with involvement so extensive that dyspnea is present, making pneumothorax inadvisable.

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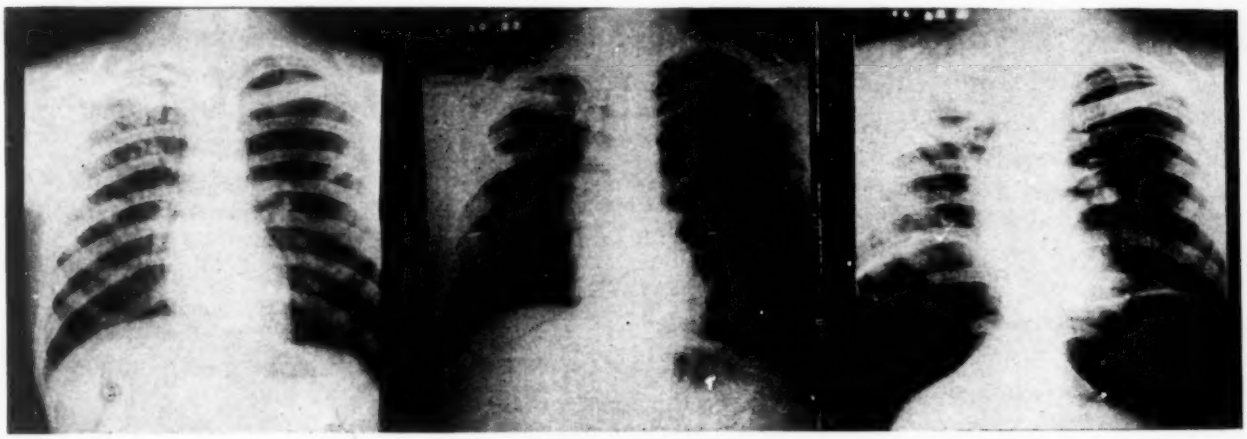

CASE J. F.
Fig. No. 1, 4-3-36, at the time patient was diagnosed.

CASE J. F.
Fig. No. 2, 12-30-37, X-ray following continuous bed rest since 4-3-36.

CASE J. F.
Fig. No. 3, 4-14-38, X-ray after three months Pneumoperitoneum treatment. Note the high position of the right diaphragm.

NOTICE

The International Physicians' Luncheon Club of New York extends a most cordial invitation to physicians visiting New York to be honored guests at an excellent international luncheon, at the same time offering the services of the Members of the Club for any information they may desire.

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FOR HIS BIRTHDAY
SUGGEST
A PHYSICAL EXAMINATION

Present-Day Management of Lung Abscess
Report of Two Illustrative Cases

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ABSCESS of the lung may be single or multiple. The majority, by far, are found in the right lower lobe; the next most frequent site of occurence is in the left lower lobe. As to their etiology, two schools of thought have been formulated; (1) those who believe abscess to be inspiratory in origin, and (2) those who believe them to be embolic. Both are correct and will account for the occurrence of the majority of pulmonary abscesses; in addition, they may arise from lymphatic extension, or they may, in a few cases, be the result of trauma externally. In support of the first theory, Richardson in 1912 reported the first cases of post-tonsillectomy abscesses, and later, Lord ascribed 34.3 per cent of his series of 227 cases to the result of this method of onset. Adding still more evidence to the inspiratory theory, Moore analyzed 202 cases in which he found that 41 per cent of the abscesses were in the right lower lobe and 19 per cent in the left lower lobe. Again, in the cases reported by Graham and Singer, 40 per cent of a series of 34 occurred in the right lower lobe, and Heuer, in a series of 42 cases found the abscesses of 21 in the right lower lobe. As early as 1913 Norris and Landis realized the importance of pneumonia as a causative agent, and they reported such pneumonic origin in 37 of a series of 100 cases. Chevalier Jackson repeatedly emphasized the necessity of considering foreign bodies as etiologic agents especially in children. Moreover, one may refer to the fine experimental evidence in favor of the embolic theory of such men as Fetterolf and Fox, Cutler, Schlueter, Holman, and Weilein. Therefore, we have come to find that the location of lung abscesses is dependent on the nature of its origin, as further shown in the following series of cases of Walker and Moore:

	Upper lobe	*Lower lobe*	*Middle lobe*
Post-operative	18	9	1
Post-pneumonic	24	44	3

The following cases are reported as being of the post-pneumonic and post-operative groups respectively. They were selected because they exemplify the whole gamut of treatment, and because they illustrate how costly a comparatively simple error of judgement might be.

Case 1: This little girl, M. L. C., aged 5, was admitted 7/2/34 to the hospital with a dull constant pain in the right lumbar area. After confirming the diagnosis, she was subjected to appendectomy under ethylene anesthesia. The flat-plate roentgenograms of the chest and abdomen were reported negative preoperatively. By the fourth post-operative day, she had begun to cough and there was x-ray evidence of a definite pneumonic area over the right base. Temperature gradually fell to normal by the tenth day, but there was a persistent greenish foul sputum. She was discharged from the hospital on the twelfth day to continue treatment at home.

Postural drainage: Within two weeks, x-ray showed the abscess definitely and her doctor placed her on postural drainage. Fever continued from 99 to 101° F. and after poor results from this therapy she was referred for bronchoscopic drainage.

Bronchoscopy: This was continued at intervals of two weeks for six weeks, but the x-ray showed extension of the original process.

Phrenicectomy: This was performed 11/20/34 under local anesthesia in an effort to stop the pneumonic spread. There was no apparent decrease in the size of the cavity from this treatment.

Artificial pneumothorax: This was the costliest error of all. She was given three of four refills of air into the right pleural cavity, but developed sudden pain and dyspnea with a resultant secondary empyema.

Closed drainage: This was performed after readmission to the hospital 1/3/35. Her postoperative course was stormy, drainage from the wound was abundant, but her cough was increasing. Five transfusions were given totalling 1300 c.c. of whole blood which brought her red cell count to 4.41 million.

Open drainage with secondary operation: This was performed in an attempt to drain the abscess, but the drainage tubes only entered the pleural cavity. After one month, the tubes were removed while the drainage was still abundant and secondary incision and introduction of the tube was necessary. X-ray showed an empyema pocket and small multiple lung abscesses. At this time, one of us was called as consultant.

Thoracoplasty: In addition to the abscess, this patient now had an empyema which needed treatment. Thoracoplasty in two stages was performed beginning with the first stage 4/29/35 and finishing one week later. The lower angle of the wound was packed open without suture to facilitate later approach to the lung. X-ray showed good collapse with obliteration of the empyema and her general condition improved as manifested by reduction of fever and cough and gain in weight.

Cautery lobectomy: This was performed under ethylene anesthesia 5/30/35 by saucerizing the right lower lobe in two stages. She responded well after the first operation, but after skin flaps were dissected in the second, apnea developed with cyanosis and the anesthetist was unable to revive her. She expired 7/30/35 on the verge of cure. She had had close to thirty transfusions during her illness. Autopsy showed obliteration of the empyema pocket and all the abscesses except one small bronchiectatic pocket measuring 2 cm. in diameter. Death had resulted from asphyxia, as these patients do not tolerate cyanosis.

* * * * *

Case 2: In presenting this case, only the high points will be touched as it parallels the preceeding case in some respects. This little girl, J. C., aged 7, developed a post-tonsillectomy pulmonary abscess in the left lower lobe 10/1/37. It was not diagnosed until 10/30/37 when she was placed at once on postural drainage. After one month when response was not deemed sufficient, bronchoscopic drainage was employed and repeated every two weeks for two months. Introduction of opaque oil in the bronchial tree at this time revealed a few smaller bronchiectatic abscesses in addition to the now-smaller original abscess. Without warning, on 3/13/38 she had a massive pulmonary hemorrhage and phrenicectomy (temporary) was performed the following day in an attempt to control it. After two transfusions her general condition had improved remarkably.

Excision lobectomy: On 4/10/38 she was subjected to excision lobectomy of the left lower lobe. After removal of the lung, it was noted that the hemorrhage had come from a large branch of the left pulmonary vein. Convalescence was uneventful, the wound healed per primum and she was discharged from the hospital asymptomatic 5/25/38.

Discussion: The treatment of acute abscesses differs greatly from chronic ones. Any abscess which dates back no longer than 8 to 12 weeks may be termed acute. It is estimated that 25 per cent are cured by merely rest and postural drainage. The results here are certainly better from hilar abscesses than peripheral ones due to the more direct path of exit for the pus. Drugs have also been used to allay the spirochetal forms of infection and neoarsphenamine is probably the most noteworthy, however it is not curative for the abscess. Vaccine and roentgen therapy have both had their advocates, but are for the most part undependable.

When rest and postural drainage fail, and within a reasonably short period of time, bronchoscopy should be tried. It will, of course, be more effective in single abscesses and especially those located centrally. There are many other advantages in bronchoscopy according to Graham, Singer and Ballon: (1) it helps to rule out foreign body, (2) it excludes new growths, (3) it reveals bronchial stenosis, and (4) it reveals the nature of the surrounding pulmonary tissue.

Pneumothorax may be tried if the abscess is a hilar one, but as in the first case reported, rupture of the abscess is nearly bound to occur if peripheral. Low pressure should be used to prevent rupture and to prevent spread into other parts of the lung by shutting off bronchial drainage, or by compression of adjacent tissue. There is always the danger of air embolism, spontaneous pneumothorax, and the delays encountered in its administration, if it fails when surgical drainage could be effectively administered. Never use pneumothorax in extensive abscess formation due to the dangers of pulmonary gangrene. The results of pneumothorax are variable.

Whittemore and Balboni reported 18 cases of whom 7 died; Goldberg and Bluementhal had 16 cases and 2 died; Tewksbury reported 35 cases and 4 deaths (all his cases were under 6 weeks duration).

Surgical measures are used when the foregoing conservative measures fail. Thus surgery is adopted for this chronic abscess and in such acute cases where we suspect (1) the presence of ruptured putrid abscess with empyema, (2) any unruptured putrid abscess, (3) abscess with undue hemorrhage.

The surgical treatment of choice after medical regime including bronchoscopy has failed is pneumonotomy or surgical drainage. This is most frequently afforded by a two-stage method in which the first stage is a simple thoracotomy for insuring adhesion formation between the lung and the chest wall. Gauze packs or other plombage material is used to pack into the wound. The time to undertake surgical drainage is after the abscess has formed a definite delimiting pyogenic membrane, thus insuring a safe localization, which certainly should have occurred by the 8th week or sooner. It is well to give medical treatment at least 12 weeks to accomplish what it will. The mortality of surgical drainage is high but will vary with the age. Lilienthal in 1928 showed a mortality of 42 per cent under 50 years and 63 per cent above 50. Muller's figures were 18.5 per cent and 62 per cent respectively for the same age limitation.

Phrenicectomy is used as an adjunct to other surgical measures but rarely alone. Moore reported 10 cases in which 4 were improved, 3 slightly improved, 2 dead and 1 other came to thoracoplasty and cautery pneumonectomy. Thoracoplasty should never be used for uncomplicated lung abscess. Thoracoplasty is the treatment for empyema complicating lung abscess and may be aided considerably by a phrenic interruption.

In empyema the treatment should be pointed for the empyema and if the abscess is single, it should clear up simultaneously, e.g. by collapse. Some form of collapse therapy is desirable and the most effective is an extrapleural thoracoplasty in multiple stages. This may be combined with thoracostomy which should have been done beforehand. This may be aided by a phrenic interruption, although Lilienthal believes there is little benefit from a phrenicectomy due to the thick exudate which may immobilize the diaphragm. Keller showed only a 7.5 per cent mortality in a series of 40 such cases because he kept open drainage through all the operative procedures, and although he had to resort to extensive scarification (including periosteum) of the pleura over the residual cavities. Collapse procedures should not be delayed long due to the imminent danger of brain abscess following a prolonged empyema. If there are multiple abscesses, the chances for return of function of that lung are slight and cautery pneumonectomy should follow the last stage thoracoplasty. Usually the results from a single cauterization covering a wide saucer-shaped area would be sufficient to encourage drainage. The only complications are hemorrhage and broncho-cutaneous fistula, either of which rarely become enough of a menace to hazard to patient's welfare. If there is a residual pulmonary suppuration, a second or third cauterization may become necessary (or a sufficient number of times as seem expedient with cure) waiting about four to six weeks for an interval. Whenever the condition of the patient did not warrant extensive collapse measures, Lilienthal would institute open drainage and lavage daily with Dakin's solution. The quantity of drainage should be measured daily and lipiodol may be instilled to obtain an idea of the size of the residual cavity. When the cough and sputum are allayed and the anemia combated, more extensive collapse therapy may be then considered.

Conclusion

It was not the purpose of this paper to discuss details of operative technique, but rather to recapitulate briefly the present day modes of therapy in pulmonary abscess. Two cases are herein reported illustrating almost every phase of treatment afforded in lung abscess, calling attention to the errors of judgement in the treatment of each case. Approximately 25 per cent of cases of pulmonary abscess will clear up with rest and postural drainage alone. The rest must come to bronchoscopy before attempting collapse therapy. The most effective surgical treatment is pneumonotomy for the chronic abs-

cess. When empyema complicates pulmonary abscess, it usually becomes necessary to utilize major collapse measures; this is preferably thoracoplasty. It may become necessary to follow collapse by cauterization of the remainder of the necrotic lung.

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An Intradermal Test for the Determination of Active Tuberculosis

BENJAMIN GRUSKIN, M.D.*
Philadelphia, Pennsylvania

ALEXANDER L. LOURIA, M.D.*
Brooklyn, New York

RICHARD H. BENNETT, M.D.*
Brooklyn, New York

EMANUEL SCHWARTZ, M.D.*
Brooklyn, New York

AS A RESULT of studies in homologous proteins and their reaction in the diagnosis of malignancy and pregnancy by the intradermal method, as described by one of us[1, 2], an attempt was made to utilize this method for the diagnosis of tuberculosis. With the clinical aid of Drs. Louria, Bennett, and Schwartz this was made possible. The material employed in the preparation of the extract is obtained from the tissue of guinea pigs, which have been previously infected with a suspension of tubercle bacilli in saline.

Theoretical Considerations

The mechanism of the reaction of homologous proteins may be explained on the basis that this type of protein when introduced intradermally, acts as an antibody to the antigen produced by the host during the active phase of the disease. This differs from the Mantoux, etc.[3, 4, 5], classical tests with tuberculin, in that instead of introducing an antigen, which is made up of tubercle bacilli and their products, depending on the antibodies of the patient to react to the antigen, in this case the antibody (the homologous protein) is introduced intradermally, depending on the antigen formed in the host during the active phase of tuberculosis to respond by the formation of pseudopodia.

Material obtained from the blood of human tuberculosis has been tried, but has been abandoned because of the fact that the reaction might be due in some cases to species specificity. Therefore, all our material has been obtained from guinea pigs, which are easily infected, and the material easily obtained, while a post mortem examination establishes whether or not they are in the active stage of tuberculosis.

Preparation of the Homologous Protein

Healthy guinea pigs are isolated and placed in cages for a period of one week. During this

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Emanuel Schwartz, M. D., Assistant Allergist, Long Island College Hospital, Director of Allergy, Queens General Hospital, Brooklyn, N. Y.

time they are weighed, their temperatures are taken, and blood counts are made on them, until it is established that they suffer from no infection. They are then inoculated with a suspension of tubercle bacilli in saline, and are allowed to remain for a period of from three to four weeks, during which time their temperature is taken every day and recorded; blood counts are made twice a week. After the third or fourth week (depending on the condition of the animal) they are anaesthetized and blood is taken from the heart with a sterile syringe and needle. This is placed in a sterile test tube, using a separate tube for the blood of each animal. The animals are then killed and posted. Only the blood of such animals as show active tuberculous infection is utilized.

The blood thus obtained is allowed to clot overnight. The serum is poured off and the clot, consisting of fibrin, blood cells, and hemoglobin, is placed in bolting cloth and washed in cold running water until the fibrin is perfectly white. In other words, the clot is cleaned of its hemoglobin and blood cells and only the fibrin is left. This is placed in four volumes of acetone for an hour, after which the acetone is decanted and an equal volume of fresh acetone is added and allowed to stand for twenty-four hours. The acetone is then poured off, and the fibrin dried in a vacuum pump until it is perfectly dry. It is then ready for extraction.

Preparation of the Extract

The fibrin is rubbed up in a mortar until it has been ground to a fine powder. This is dissolved in tenth normal sodium hydroxide in the proportion of one and one-half grams of fibrin to one hundred c.c. of tenth normal sodium hydroxide. The fibrin and sodium hydroxide must be thoroughly ground together. The solution of the fibrin in sodium hydroxide is then placed in a glass stoppered Pyrex container and allowed to stand for forty-eight hours. The container should be gently rotated a few times each day to keep the fibrin and sodium hydroxide solution thoroughly mixed, but it should not be shaken vigorously as we have found that this thickens the solution.

After forty-eight hours the solution of the fibrin in sodium hydroxide is placed in large test tubes and is centrifuged at a speed of 2500 R.P.M. for thirty minutes. The supernatant fluid is then pipetted off and is filtered through a coarse Berkefeld filter. The filtrate is then neutralized and adjusted to a pH of 6.9 with an acid buffer made as follows:

KH_2PO_4 (anhydrous)	2.27 grams
HCl (Sp. G. about 1.19, 35%	4.235 c.c.

Distilled water to make one liter.

The extract is then placed in sterile pyrex containers to which is added a mixture of one part tricresol to three parts glycerine, in the proportion of two drops of the mixture to each ten c.c. of the finished extract. The extract containers are then capped with sterile rubber stoppers and thoroughly shaken to dissolve the preservative. A sterile needle is then introduced into the stopper to allow the escape of excess air formed by the shaking.

The extract is then heated for fifteen minutes in a water bath, the temperature of which is 80° centigrade. The solution is then allowed to cool. It is placed in the ice chest for a week, after which the pH is checked again. If any changes have taken place, the pH is corrected and the solution allowed to stand for another week, after which the pH is again determined and corrected if it has changed. Since the pH is of great importance in the correctness of the test, it is best to adjust the pH at these one week intervals until the pH remains constant at 6.9. We found that the only condition which renders the results of this test innacurate is a change in pH of the extract. The above precautions have therefore been devised. We found it best to use the spot plate method until the last determination has been made, after which the final result is checked by the potentiometer. It is very important that no air be blown into the container when introducing the needle. The plunger of the syringe should therefore be pushed entirely in to the zero mark before introducing the needle into the rubber cap of the container.

Method of Performing Test

The test is performed by the intradermal injection of the extract described above. For the injection a one c.c. tuberculin type syringe with a one-half inch number 27 gauge

needle may be used to best advantage. The area best suited for the injection seems to be that on the antero-medial aspect of the upper arm over the biceps muscle in a region which is free from superficial veins. The skin is lightly wiped with alcohol and then as lightly wiped dry with a sterile gauze sponge. With the skin kept firm, but not taut, the needle is held parallel to the skin and passed into the epidermis at such a depth that the point is visible at all times. Inserting the needle about 1/8th of an inch, so that the eye is covered, usually suffices. One-tenth c.c. of the extract is then injected very slowly, so that a perfectly round wheal with smooth edges is formed by the injection. The needle is then withdrawn, and the forearm is flexed across the chest or in the lap of the patient so as to keep the skin relaxed and not under tension, and to prevent the extravasation of the fluid. Readings may be made in from two to five minutes. Positive tests will show very definite pseudopodia. Negative tests show no such reaction, remain perfectly even at the margin of the bleb and are soon resorbed. A more detailed description has been given by Gruskin in his previous papers[1, 2], on the intradermal tests, and by Schwartz[6].

Although the technique of the test is simple, carelessness will lead to incorrect results. A few factors leading to wrong diagnoses may be enumerated as follows:

1. Making the injection too deeply or too superficially. This will tend to obscure the formation of pseudopodia.

2. Pressure of the fluid during injection. The injection should be made as slowly as possible so that there is no undue pressure of fluid which may tend to cause false pseudopodia to appear. The bleb formed by the injection should be perfectly round and smooth at the margin when the injection is just finished. If it is not round the injection should be repeated.

3. Size of the needles. The needles should not be larger than 27 gauge, as larger needles will not allow the injection to be superficial enough, and the amount of fluid entering in a given time will cause false pseudopodia to appear during the injection.

4. Proper preservation of the antigen. The extract which is used in this test must be kept in an ice chest or refrigerator at all times when it is not being used. If exposed to warm air for a long period of time the pH of the extract should be checked. The proper pH is 6.9. It is also important to avoid blowing air into the extract vial as we have found that this, too, may change the pH in time. The plunger of the syringe should be kept at the zero mark when introducing the nedle into the rubber cap of the bottle containing the extract.

Contraindications to the Test

There are a few conditions which interfere with Intradermal testing. These conditions necessarily interfere with this test. The most important factor influencing wheal formation is the state of circulation of the tissues, according to Coca, Walzer, and Thommen[7]. Those conditions which diminish or increase the rapidity of blood flow likewise alter wheal formation. Similar changes take place when the skin has been injured recently as in the case of sunburn, x-ray or radium as well as with extensive skin lesions either of the hyper or hypokeratetic type. According to R. A. Cooke[8], repeated tests with the same atopen at the same skin site will result in a nonspecific exhaustion of the tissue and hence diminish the skin reaction.

Exaggerated dermographic responses have been found by Lewis in some normal individuals[9]. This is rarely elicited in a carefully given intradermal injection where the trauma is minimal. If there is a dermographic response, a control will cause the same reaction. It is essential, therefore, that a control be used at all times. Such a control should not only be equivalent to physiological saline, but should have the same nitrogen content and the same pH as the testing solution. This may be made from the blood fibrin of normal guinea pigs in the same manner as described above for the original extract.

The skin of some individuals may contain a large amount of loose connective tissue in the superficial layers. This will allow the testing solution to spread and permit false pseudopod formation. In such cases it is necessary to introduce the extract slightly deeper.

All these factors should be taken into consideration when using any form of intradermal test.

Summing up briefly, the contraindications to this test are:

1. Diminished blood flow in the tissues as in edema, cardiac decompensation, etc.

2. Marked dehydration.

3. Recent sunburn or radium and x-ray treatments and extensive skin lesions as described above.

4. Increased dermographic response as determined by the use of a suitable control.

5. Increased amounts of loose connective tissue in the skin, causing premature spreading of the injection fluid. Injections should then be made slightly deeper.

6. In endocrine disturbances and hypersensitive skins.

7. In febrile and inflammatory conditions.

8. In the presence of excessive heat, which may soften the skin and lead to false results. Always cool such skins with cold towels before testing.

9. Lastly, the syringe should be completely filled to the 0.1 c.c. mark before injection so that no air is blown in with the injection, because this will definitely cause the formation of false pseudopodia.

Once these factors have been eliminated, the test will give correct results providing the other factors, i.e. proper extract and correct technique, are used as aforementioned. This may be verified by the series of cases analysed in this paper.

It is interesting that in our experience with this test we have found that some tuberculous patients, after undergoing a period of treatment will at one time or another show a weakly positive or negative reaction during the quiescent stage of the disease, yet are liable to show a positive reaction when the test is performed a few days later. This is evidently the result of lack of antigen formation at that period. Therefore, we have made it a rule not to pronounce a patient inactive unless four negative reactions have been obtained, having been tested once a week for a period of four weeks. Of course, this last applies only to patients under treatment, as rest, nourishment, etc., tend temporarily to quiesence of activity and antigen production. As a diagnostic measure, provided that all contradindications have been observed, we have found that a positive reaction represents active tuberculosis and a negative reaction shows non-activity.

Summary

The usefulness of this test is evident from the above description. First, because activity or non-activity of a case of tuberculosis can be determined. Second, because this reaction is not dependent on the antibody response of the patient for its manifestation, and hence will give a positive reaction in miliary tuberculosis and tuberculous meningitis, which usually give negative reactions with the older tests on account of the lack of immune bodies. Third, the fact that the reaction may be read in a few minutes makes it more applicable especially in group examinations. Fourth, there is no possibility of stirring up a latent infection as is sometimes the case with an antigen made from tubercle bacilli. A fifth advantage of the test is that it will give a negative reaction in a non-active case, in contradistinction to the older tests which usually continue to give positive reactions even when the patient is clinically well, after having been once infected.

Tests were performed on chest cases with the following results:

	Cases	*Correct*
Temple University Hospital and Clinic and Eagleville Dispensary	200	95%
Brooklyn Tuberculosis Hospital, by L., B., and S.	150	92%
Northeastern Hospital Chest Clinic by Dr. S. F. Madonna, Phila.	135	95%
Paris Hospital, Paris, Ill. by Dr. H. D. Junkin	100	96%

All these cases were checked by x-ray, sputum examination or guinea pig inoculation. In addition to tuberculosis of the chest the following conditions were found:

	Cases
Tuberculous iritis	6
Acute tuberculous choroiditis	1
Tuberculous irido-cyclitis	1
Tuberculous meningitis	2
Tuberculosis of the gastro-intestinal tract	2
Tuberculous peritonitis	1
Tuberculosis of the kidney	2
Miliary tuberculosis	3

Negative reactions were found in the following types of cases:

	Cases
Carcinoma of the lung	2
Lung Abscess	2
Asthma	3

	Cases
Bronchopneumonia	1
Pneumonitis	1
Lobar pneumonia	2
Non-tuberculous infection of the parotid gland	1
Pyelitis, non-tuberculous	1
Chronic atrophic arthritis	2
Old case of Pott's disease of the spine, cured fifteen years	1

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Eighty-Eighth Annual Meeting of the Pennsylvania State Medical Society

Scranton, Pennsylvania
October 3-6

TUBERCULOSIS DAY - OCTOBER 6th

9 A.M., Auditorium, Masonic Temple.

Pathology, Symptoms, and Diagnosis of Pulmonary Tuberculosis (20 minutes).

DR. JULIUS L. WILSON, WEST HAVEN, CONN.

Treatment of Pulmonary Tuberculosis (Lantern Demonstation) (10 minutes).

DR. FRANK WALTON BURGE, PHILADELPHIA, PA.

10:30 A.M., Norman Hall, Masonic Temple.

Round Table Conference on Tuberculosis (90 minutes).

In charge of:

DR. JULIUS L. WILSON, WEST HAVEN, CONN.—DR. FRANK WALTON BURGE, PHILADELPHIA, PA.—DR. JOSEPH W. POST, PHILADELPHIA, PA.—DR. ESMOND R. LONG, PHILADELPHIA, PA.

NOTE: In the afternoon the Fall Meeting of the Board of Directors of the Pennsylvania Tuberculosis Society will be held.

7:30 P.M. Tuberculosis Dinner: Dr. LOUIS CLERF, PHILADELPHIA, PA., Toastmaster.

Speakers:

Dr. Edith MacBride-Dexter, Pa. Secretary of Health, subject: The Pennsylvania Plan for Tuberculosis;

Dr. Esmond Long, Director of Henry Phipps Institute, Philadelphia, subject: Case Finding Under the Pennsylvania Plan and Attitude of the National Tuberculosis Association to the Pennsylvania Plan;

Dr. Frank Walton Burge, Philadelphia, subject: Cooperation of Tuberculosis Agencies Under the Pennsylvania Plan;

Dr. Champneys H. Holmes, President of the American College of Chest Physicians, Atlanta, Ga., subject: Attitude of Other States to the Pennsylvania Plan for Tuberculosis.

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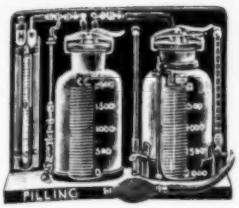
Physician in Charge
WILLIAM DEVITT, JR.
Superintendent



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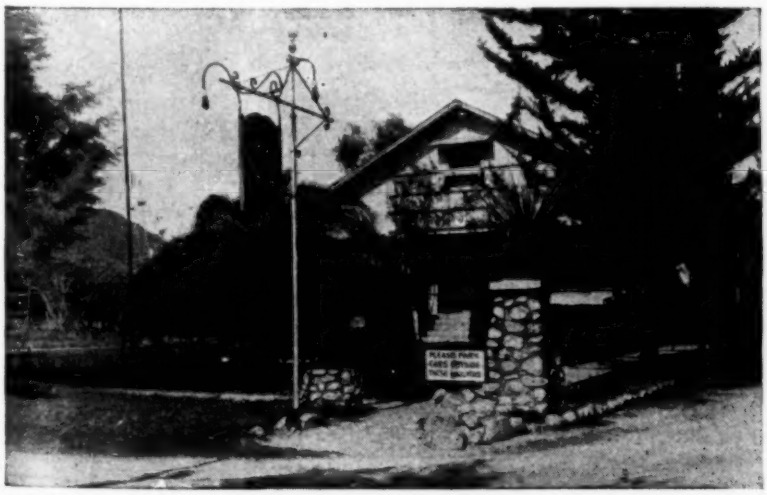

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C. E. ATKINSON, M.D.
MEDICAL DIRECTOR

Organization News

Committee on Tuberculosis Organization.

The Committee for the Advancement of Tuberculosis Organization in Medicine of the American College of Chest Physicians announces the release of its program for this year. Letters have been mailed to the forty nine Governors of the College outlining the following purposes of the committee and the procedure:

"It is the purpose of the Committee for the Advancement of Tuberculosis Organization in Medicine to set up in each State Medical Society a Committee on Tuberculosis. Wherever possible, it is suggested that the Chairman and the other members of the Tuberculosis Committee of the State Medical Society be duly elected Fellows of the American College of Chest Physicians. (This is what is known as the "Pennsylvania Plan." The plan was presented by Dr. Frank Walton Burge, Philadelphia, Pa.; before the meeting of the American Medical Association in General Assembly at San Francisco, California, June 14, 1938).

Following the general idea of the "Pennsylvania Plan"; it is proposed that the State Tuberculosis Committee proceed to organize a Tuberculosis Committee in each County Medical Society within the State. Wherever possible, the Tuberculosis Committee of the County Medical Societies should be composed of Fellows of the American College of Chest Physicians.

It should be the duties of these committees to make a study of the facilities within their respective states and counties for the treatment of tuberculosis and other lung diseases; to cooperate with all existing agencies for the improvement of conditions when necessary, to pay particular attention to the medical needs of the patients, and to look after the welfare of the physicians engaged in the specialty of chest diseases both in and out of sanatoria."

Submitted to the Governors of the American College of Chest Physicians by:

Ralph C. Matson, M.D.
Chairman
Portland, Oregon

Frank Walton Burge, M.D.
Vice-Chairman
Philadelphia, Pa.

Louis F. Knoepp, M.D.
Beaumont, Texas

Fred M. F. Meixner, M.D.
Peoria, Illinois

Edward J. Murray, M.D.
Lexington, Kentucky

Paul H. Ringer, M.D.
Asheville, N. C.

Fred A. Slyfield, M.D.
Seattle, Washington

Chas. C. Trembley, M.D.
Saranac Lake, N. Y.

Wm. C. Voorsanger, M.D.
San Francisco, Calif.

Members of the Committee for the Advancement of Tuberculosis Organization in Medicine will assist the Governors of the following states in establishing such committees in the states where committees do not now eixst:

Chas. C. Trembley, M.D.
New York
Rhode Island
Connecticut
Massachusetts
New Hampshire
Vermont
Maine

Frank Walton Burge, M.D.
Pennsylvania
New Jersey
West Virginia
Ohio
Delaware
Maryland
District of Columbia

Paul H. Ringer, M.D.
Florida
Georgia
S. Carolina
N. Carolina
Virginia

Edward J. Murray, M.D.
Kentucky
Tennessee
Mississippi
Alabama
Oklahoma

Louis F. Knoepp, M.D.
Texas
Louisiana
Arkansas
Kansas
Missouri

Wm. C. Voorsanger, M.D.
California
Arizona
New Mexico
Colorado
Utah

Fred A. Slyfield, M. D.
Washington
Oregon
Montana
Idaho

Fred M. F. Meixner, M.D.
Illinois
Iowa
Indiana
Michigan
Wisconsin
Minnesota
Nebraska

Ralph C. Matson, M.D.
U. S. Possessions
Mexico

Committee on Medical School Education

Dr. E. W. Hayes, Monrovia, California, Chairman of the Committee on Medical School Undergraduate Teaching of the American College of Chest Physicians announces that the following Fellows of the College will comprise the committee for this year:

Dr. John Alexander, Ann Arbor, Michigan.
Dr. A. J. Cohen, Philadelphia, Pa.
Dr. Benjamin Goldberg, Chicago, Illinois.
Dr. Jay Arthur Myers, Minneapolis, Minn.
Dr. John H. Peck, Oakdale, Iowa.
Dr. William Atmar Smith, Charleston, S. C.
Dr. Sam'l H. Watson, Tucson, Arizona.

Dr. Hayes has outlined the program of this committee in his presidential address, delivered before the Fourth Annual Meeting of the American College of Chest Physicians at San Francisco in June of this year. The address was published in the July Issue of *Diseases of the Chest* and reprints may be had upon request.

The committee will work towards the improving of the teaching of diseases of the lungs in those medical schools which are not up to standard.

Statistical Committee

Dr. J. Winthrop Peabody, Washington, D. C., Chairman of the Statistical Committee of the American College of Chest Physicians announces that the following Fellows of the College will serve on the committee for this year:

Dr. Sydney Slater, Worthington, Minn.
Vice-Chairman
Dr. John Allen, Omaha, Nebraska.
Dr. G. C. Bellinger, Salem, Oregon.
Dr. Byron Harman, Verona, N. J.
Dr. Elmer Highberger, Oil City, Pa.
Dr. Arthur D. Long, El Paso, Texas.
Dr. William D. Winn, Springville, Calif.

The committee will continue to gather information on the progress of collapse therapy in

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LEROY T. PETERSEN, M.D.----------Asst. Physician and Roentgenologist
F. M. POTTENGER, JR., M.D.----------Assistant Physician

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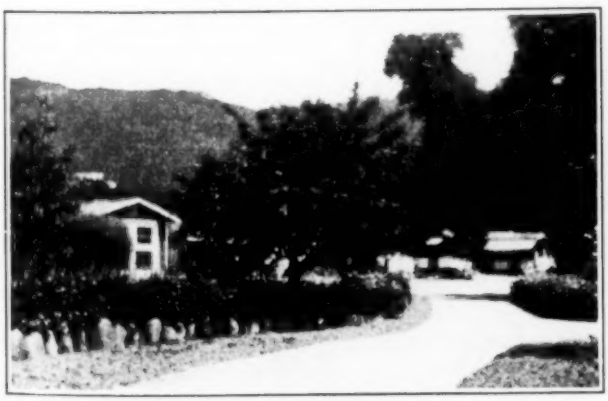

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E. W. HAYES, M.D., Medical Director

tuberculosis, facilities for the care of the tuberculous, and will include this year, a survey of the salaries paid to physicians who are resident at or affiliated with tuberculosis sanatoria, and the housing facilities available for resident physicians. This latter survey will furnish the information to the Committee for the Advancement of Tuberculosis Organization in Medicine and it will be the first step toward securing adaquate salaries, where needed, and proper housing conditions for physicians who are affiliated with the sanatoria of this country.

SOCIETY NEWS

Announcement

Dr. Champ H. Holmes, President of the American College of Chest Physicians was married on August 25th to Lena Jacqueline Swift at Atlanta, Georgia.

Dr. Martin Henry Collier, Lakeland Sanatorium, Grenloch, N. J., has been appointed Governor of the American College of Chest Physicians for the State of New Jersey.

Dr. Mildred E. Thoren, Weimar, California, a Fellow of the American College of Chest Physicians and the staff of the Weimar Sanatorium presented a symposium on compression therapy before the Placer County Medical Society at a recent meeting.

Dr. Paul H. Ringer, Asheville, North Carolina, Regent of the American College of Chest Physicians; addressed the Greene County Medical Society, Greenville, Tennessee. Dr. Ringer spoke on the "Early Diagnosis and Treatment of Tuberculosis".

Dr. Jay Arthur Myers, Minneapolis, Minnesota, Regent of the American College of Chest Physicians; was a guest speaker at the Mississippi Valley Tuberculosis Conference held at St. Louis, September 21-24. Dr. Myers presented a symposium on the "Modern Concepts of Tuberculois". Dr. Vera V. Norton, Cincinnati, Ohio, a Fellow of the American College of Chest Physicians is the President of the Association.

Dr. Arnold Shamaskin, Bedford Hills, New York, a Fellow of the American College of Chest Physicians; has resigned as the medical superintendent of the Montefiore Hospital Country Sanatorium, Bedford Hills, to become superintendent and medical director of the Jewish Consumptives Relief Society Sanatorium at Spivak, Colorado.

Dr. Byron F. Francis, Seattle, Washington, a Fellow of the American College of Chest Physicians; presented a paper before the meeting of the Washington State Medical Society at Bellingham. The title of his paper was, "Recent Advances in our Knowledge of Pulmonary Emphysema".

Pennsylvania Tuberculosis Committees Completes Organization.

Dr. Frank Walton Burge, Philadelphia, Pa., Chairman of the Committee on Tuberculosis announces the names of the following physicians who comprise the State Committee and the chairmen of the county committees:

STATE COMMITTEE:

JOHN H. BISBING, M.D. ..... Reading
ROYAL H. McCUTCHEON, M.D. ..... Bethlehem
SYDNEY J. HAWLEY, M.D. ..... Danville
CLARENCE R. PHILLIPS, M.D. ..... Harrisburg
J. PAUL FRANTZ, M.D. ..... Clearfield
ROSS K. CHILDERHOSE, M.D. ..... Allenwood
VICTOR M. LEFFINGWELL, M.D. ..... Sharon
O. S. KOUGH, M.D. ..... Uniontown
CHARLES C. ROSS, M.D. ..... Clarion
C. HOWARD MARCY, M.D. ..... Pittsburgh
CHARLES H. MINER, M.D. ..... Wilkes-Barre

COUNTY COMMITTEE:

DR. WILLIAM J. BIERER ..... Kittanning, Pa.
Armstrong County Medical Society.
DR. RUTH W. WILSON ..... Beaver, Pa.
Beaver County Medical Society.
DR. JOHN H. BISBING ..... Reading, Pa.
Berks County Medical Society.
DR. JOHN T. SCHAFFER ..... Sellersville, Pa.
Bucks County Medical Society.
DR. J. PAUL FRANTZ ..... Clearfield, Pa.
Clearfield County Medical Society.
DR. DAVID S. STEYER ..... Mt. Holly Springs, Pa.
Cumberland County Society.
DR. CHAS. S. AITKEN ..... Brookline, Pa.
Delaware County Medical Society.
DR. O. S. KOUGH ..... Uniontown, Pa.
Fayette County Medical Society.
DR. W. C. SCHULTZ, SR. ..... Waynesboro, Pa.
Franklin County Medical Society.
DR. WILLIAM A. DOEBELE ..... Huntingdon, Pa.
Huntingdon County Medical Society.
DR. FRANK C. WAGENSELLER ..... Richfield, Pa.
Juniata County Medical Society.
DR. PAUL C. McANDREWS ..... Scranton, Pa.
Lackawanna County Medical Society.
DR. ROBERT M. OLSEN ..... Palmyra, Pa.
Lebanon County Medical Society.
DR. CLYDE H. KELCHNER ..... Allentown, Pa.
1225 Turner Street.
Lehigh County Medical Society.
DR. C. H. MINER ..... Wilkes-Barre, Pa.
Luzerne County Medical Society.
DR. S. B. GIBSON ..... Williamsport, Pa.
Lycoming County Medical Society.
DR. FRANCIS DE CARIA ..... Bradford, Pa.
McKean County Medical Society.
DR. R. H. McCUTCHEON ..... Bethlehem, Pa.
Northampton County Medical Society.
DR. CHRISTIAN NISSLER ..... Philadelphia, Pa.
Philadelphia County Medical Society.
DR. J. STRATTON CARPENTER ..... Pottsville, Pa.
Schuylkill County Medical Society.
DR. ELMER HIGHBERGER ..... Oil City, Pa.
Venango County Medical Society.
DR. A. C. VOIGHT ..... Hawley, Pa.
Wayne-Pike County Medical Society.
DR. H. MALCOLM READ ..... York, Pa.
York County Medical Society.